September 21, 2000

MEMORANDUM

TO: Orville D. Green, Administrator
State Air Quality Program

FROM: Robert Baldwin, Air Quality Engineer
State Technical Services

THROUGH: Daniel Salgado, Discipline Lead
Process Engineering Group
State Technical Services Office

SUBJECT: T2-9903-172, NW Design Molders, Incorporated, Jerome
Technical Analysis for Tier II Operating Permit No. #053-00005

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 404.04 (Rules for the Control of Air Pollution in Idaho) (Rules) for Tier II Operating Permits.

PROJECT DESCRIPTION

This project is for the issuance of a Tier II Operating Permit (OP) for NW Design Molders, Incorporated located at Jerome, Idaho. The emissions sources of the facility are: a natural gas boiler, a pre-expander, a 24-hour pre-puff storage process, molder, presses, and post molding storage area. This facility was built and operated without obtaining a permit to construct. This facility started construction in February 1998, and started operating March 1998. The purpose of issuing this Tier II OP is to conduct a technical analysis to address emission units constructed in the past without a permit to construct (PTC) and to set up emission limits to give the facility operational flexibility.

FACILITY DESCRIPTION

The Expandable Polystyrene (EPS) raw material, or beads, come into the facility in 1,000 pound lined Gaylord boxes. The beads contain an encapsulated blowing agent, pentane, usually 3.5 to 6.5% on the material by weight. The emission rates at each phase of the operation vary according to such factors as the density of the expanded beads, shape and size of the molded part, and finished goods storage requirements. The beads are typically vacuum fed from the Gaylords to the pre-expander where the beads are partially expanded to their desired density. About 25% of the pentane is released in the expansion process. The material is then aged 2 to 48 hours to allow this pre-puff to stabilize by diffusing air into the expanding beads. About 20% of the initial pentane is released during this aging process. The material is then transferred directly to molds or presses where, with the use of steam, they are fused together into shapes created by the forms. About 15-25% of the initial pentane is released during the molding process. In the post-molding phase, about 15% of the initial pentane is released in the first 24 hours, and 10% in the next 24 hours. The remaining 15% pentane diffuses out of the product over a long period of time.

The emission points as described above are identified by the Radian Report on Table 5-1 and Figure 5-2. The Radian Report can be found within the Appendix of this memorandum.

The boiler that generates steam for the process is another emission point. The combustion products of the natural gas show a negligible amount of oxides of nitrogen, sulfur, and VOCs.

The following is a more descriptive list of the emission units:

Boiler:	Manufactured by Superior model 6-750 with a capacity of 6.3 MM BTU per hour and combust natural gas only.
Pre-Expander:	Manufactured by Kurtz model 1609/90 with a capacity of 100 pounds per hour. An average of 24% of initial pentane is emitted during this process.
Pre-Expander:	Manufactured by NWB with a capacity of 600 pounds per hour. An average of 24% of initial pentane is emitted during this process.
Pre-puff aging Bags and Area:	Manufactured by Advance Specialties. An average of 19% of initial pentane is emitted during this process.

Molding:	Manufactured by Tri, model 2001, has a capacity of 875 pounds per hour. An average of 14% of initial pentane is emitted at this time.
Press:	Manufactured by Spingfield, model H30 with a capacity of 875 pounds per hour. An average of 14% of initial pentane is emitted at this time.
Press:	Manufactured by FMI, model 130 with a capacity of 875 pounds per hour. An average of 14% of initial pentane is emitted at this time.

Post Molding Aging (1st 24 hours): An average of 15% of initial pentane is emitted at this time.

Post Molding Aging (2nd 24 hours): An average of 13% of initial pentane is emitted at this time.

Fifteen percent (15%) of the initial pentane stays within the produced product and is diffused over a long period of time.

SUMMARY OF EVENTS

On March 16, 1999, DEQ received an application for a Tier II OP from NW Design Molders, Inc. at Jerome, Idaho. On March 19, 1999, a memorandum was sent to Dave Sande of DEQ indicating that Tier II application fees were applicable to NW Design Molders. On April 15, 1999, DEQ sent NW Design Molders a letter requesting the registration fees. On April 28, 1999, DEQ received the $500 Tier II application fee. On October 8, 1999, DEQ received NW Design Molders, Inc. registration fees. In addition, the registration fees while the facility's potential to emit (PTE) was over 100 tons per year have been received by DEQ. On November 24, 1999, the application was declared complete.

DISCUSSION

1. Emission Estimates

The emissions estimated from the natural gas combusted within the boiler were negligible. The permit requires that only natural gas can be combusted.

The emission estimates for the various processes of the Expandable Polystyrene (EPS) operations were established from a Report developed by Radian Corporation for U.S. EPA. Parts of this report can be found within the Appendix of this memorandum. This report had established that, on the average, eighty-five percent (85%) of original pentane within the EPS beads by weight would be released during the various processes in developing the variety of expanded plastic foam products.

The VOC emissions within this permit were based on the estimate that eighty-five percent (85%) of the initial pentane content of the beads were released through the various processes at the site of this facility. These VOC emissions were based on the assumption that the beads contain no more than seven percent (7%) pentane by weight before the process begins. This 7% or less pentane content by weight is a permit requirement.

Since this is a new facility that is growing in sales each year, an estimated allowance for each year's production growth was developed to establish the pound per hour (lb/hr) and ton per year (T/yr) emissions that the facility could operate and be in compliance with the permit over the permit's five (5) year term. It was estimated the business may increase by seventy-five percent (75%) of its present production rate.

The VOC emissions generated from the processes listed in Appendix A of the permit were determined by taking either the amounts submitted within their Tier II operating permit application, or the amount stated within the facility's prior year's registration emissions and multiplying this figure by the established factor of 1.75 to account for the growth over the 5 year term of the Tier II operating permit.

However, the fact that beads of less than seven percent (7%) pentane content are on the market, this would allow a larger throughput for the same total VOC emissions from the facility. Since the throughput is to be monitored as a permit requirement, the facility should be aware of any arising need for permit modifications.

Under the authority of IDAPA 58.01.01.403.01, pentane is a toxic air pollutant (TAP) under IDAPA 58.01.01.585, pentane has a screening emission level of 118 #/hr. This facility is limited by this operating permit to emit only 38 lb/hr of pentane. When the facility was intially constructed and operating under its PTE limit the maximum pentane pound per hour emission was approximately 49 lb/hr .

2. Modeling

No modeling was performed. Under the authority of IDAPA 58.01.01.403.01 and listing in IDAPA 58.01.01.577. There is no National Ambient Air Quality Standard for volatile organic compounds (VOCs).

3. Area Classification

This facility is located in Jerome Idaho, which is located in AQCR 63. The area is attainment for all criteria air pollutants.

4. Facility Classification

The facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The facility is classified as an A2 source because the actual emissions of any criteria pollutant is less than 100 tons per year. Information necessary to update the AIRS database is included within Appendix B of this Technical Memorandum.

5. Regulatory Review

This OP is subject to the following permitting requirements:

a.	IDAPA 58.01.01.401	Tier II Operating Permit
b.	IDAPA 58.01.01.403	Permit Requirements for Tier II Sources
c.	IDAPA 58.01.01.404.01(c)	Opportunity for Public Comment
d.	IDAPA 58.01.01.404.04	Authority to Revise or Renew Operating Permits
e.	IDAPA 58.01.01.406	Obligation to Comply
f.	IDAPA 58.01.01.470	Permit Application Fees for Tier II Permits
g.	IDAPA 58.01.01.585	Toxic Air Pollutants Non-Carcinogenic Increments
h.	IDAPA 58.01.01.625	Visible Emission Limitation
i.	IDAPA 58.01.01.650	General Rules for the Control of Fugitive Dust
j	IDAPA 58.01.01.676	Fuel Burning Equipment-Standards for New Sources

FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.470. The facility is subject to permit application fees for this Tier II OP of $500. The fee was received by DEQ on April 28, 1999.

RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue a Tier II OP to NW Design Molders, Incorporated at Jerome, Idaho. An opportunity for public comment on the air quality aspects of the OP shall be provided in accordance with IDAPA 58.01.01.404.01.c. Staff members have notified the facility in writing of the required Tier II application fee of five hundred dollars ($500.00). The fee was received by DEQ on April 28,1999.

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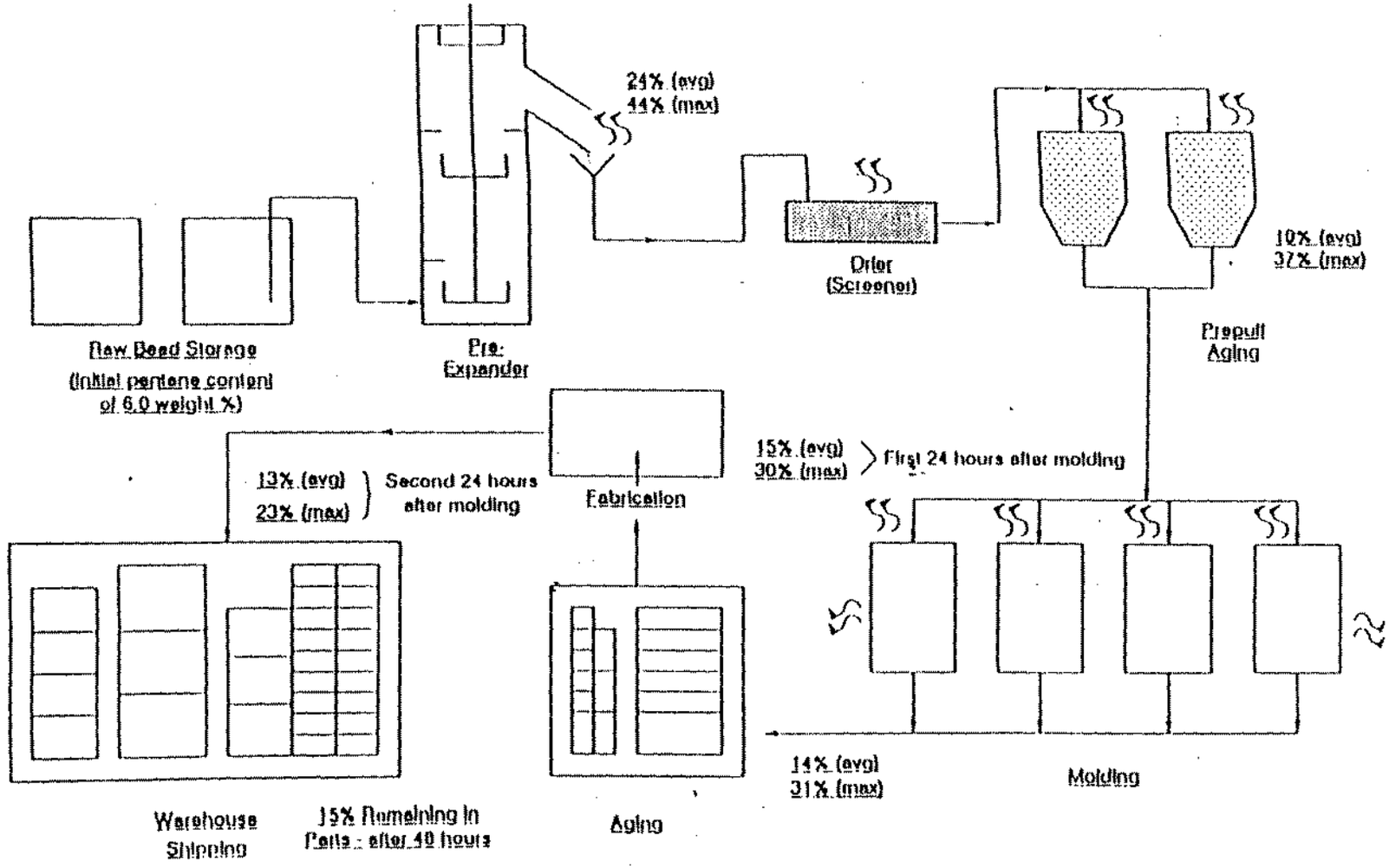
cc: DEQ State Office
Twin Falls Regional Office

APPENDIX A

TABLE 5-1. PENTANE LOSS ANALYSIS FOR EPS BEAD PRODUCTS[4]
(Percent of Original Pentane Blowing Agent)

	% Lost During Expansion	% Lost During 24 Hrs. Storage of Prepuff	% Lost During Molding	% Lost 1st 24 Hours after Molding	% Lost 2nd 24 Hours after Molding
Average	24	19	14	15	13
Range	10-44	5-37	4-31	5-30	3-23

Average % pentane left in molded product after 48 hours = 15%.



From: Coughenour, R.D. The Pentane Issue. Presented at 16th Annual SPI Expanded Polystyrene Division Conference: March 17, 1999, San Diego, California.

Figure 5-2. Average and Maximum Percent Pentane Losses at Manufacturing Emissions Points for EPS Facilities

APPENDIX B

ABBREVIATED AIRS DATA ENTRY SHEET

Name of Facility: NW Design Molders, Inc., Jerome

AIRS/Permit #: 053-00005

Permit Issue Date:

*Source/Emissions Unit Name (25 spcs) (Please use name as indicated in permit)	SCC # (8 digit #)	Air Program (SIP/NESHAP/ NSPS/PSD)
* Natural Gas Boiler < 10 MM BTU/hr	10300603	
Expansion Process Via Steam	30800801	
Molding	30800802	
Bead Storage	30800803	